

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently amended) A method for detecting and determining the quantity of bacteria that oxidize ammonia to nitrite in a medium, wherein the 16S rDNA of the bacteria includes a nucleotide sequence selected from the group consisting of SEQ ID NO:1, and SEQ ID NO:2, ~~SEQ ID NO:3 and SEQ ID NO:4~~, comprising:

providing a detectably labeled probe comprising ~~including~~ a nucleotide sequence ~~as set forth in~~ ~~selected from the group consisting of SEQ ID NO:5 and SEQ ID NO:8;~~

isolating total DNA from the medium;

exposing the isolated total DNA to the detectably labeled probe under conditions under which the probe hybridizes to only the nucleic acid of bacteria having 16S rDNA including the nucleotide sequence; and

detecting and measuring the amount of hybridized probe,

wherein the presence of hybridized probe is indicative of the presence of bacteria that oxidize ammonia to nitrite and the amount of hybridized probe is indicative of the quantity of said bacteria that oxidize ammonia to nitrite in said medium.

2. (Original) The method of claim 1, wherein the medium is selected from the group consisting of aquarium water, freshwater, saltwater and wastewater.

3. (Original) The method of claim 1, wherein the medium includes a material selected from the group consisting of aquarium gravel, filter sponges, filter floss and plastic filter media.

4. (Original) The method of claim 3, wherein the total DNA is isolated from the material.

5. (Original) The method of claim 1, wherein providing a detectably labeled probe further comprises including the detectably labeled probe on a DNA chip.

6. (Original) The method of claim 1, wherein the method for detecting and determining the quantity of bacteria that oxidize ammonia to nitrite in a medium is an automated process.

7. (Currently amended) The method of claim 6, wherein the automated process is selected from the group consisting of DNA microarray, ~~protein microarray~~, biosensor, bioprobe, capillary electrophoresis and real-time PCR.

8-14. (Canceled)

15. (Currently amended) A method for detecting and determining the quantity of bacteria that oxidize ammonia to nitrite in a medium, wherein the 16S rDNA of the bacteria includes a nucleotide sequence selected from the group consisting of: ~~a nucleotide sequence that has greater than 98% identity over the full length thereof to SEQ ID NO:3, a nucleotide sequence that has greater than 98% identity over the full length thereof to SEQ ID NO:4,~~ a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:1 and a nucleotide sequence that has at least 96% identity over the full length thereof to SEQ ID NO:2, comprising:

providing a detectably labeled probe comprising that has at least 96% identity over the full length thereof to a nucleotide sequence as set forth in selected from the group consisting of SEQ ID NO:5 and SEQ ID NO:8;

isolating total DNA from the medium;

exposing the isolated total DNA to the detectably labeled probe under conditions under which the probe hybridizes to only the nucleic acid of bacteria having 16S rDNA including the nucleotide sequence, wherein the conditions comprise the following: hybridization in 30% formamide, 0.9 M NaCl, 0.01% sodium dodecyl sulphate, 20 mM Tris/HCl pH 7.4 at 46 °C, and washing with 120 mM NaCl, 5 mM EDTA, 0.01% sodium dodecyl sulphate, and 20 mM Tris/HCl at 48 °C; and

detecting and measuring the amount of hybridized probe,

wherein the presence of hybridized probe is indicative of the presence of bacteria that oxidize ammonia to nitrite and the amount of hybridized probe is indicative of the quantity of said bacteria that oxidize ammonia to nitrite in said medium.

16. (Original) The method of claim 15, wherein the medium is selected from the group consisting of aquarium water, freshwater, saltwater and wastewater.

17. (Original) The method of claim 15, wherein the medium includes a material selected from the group consisting of aquarium gravel, filter sponges, filter floss and plastic filter media.

18. (Original) The method of claim 17, wherein the total DNA is isolated from the material.

19. (Original) The method of claim 15, wherein providing a detectably labeled probe further comprises including the detectably labeled probe on a DNA chip.

20. (Original) The method of claim 15, wherein the method for detecting and determining the quantity of bacteria that oxidize ammonia to nitrite in a medium is an automated process.

21. (Currently amended) The method of claim 20, wherein the automated process is selected from the group consisting of DNA microarray, ~~protein-microarray~~, biosensor, bioprobe, capillary electrophoresis and real-time PCR.

22-32. (Canceled)